originated in the New Zealand area and spread from here to outlying lands. Both species appear to spawn in brackish water, and it is quite possible that the young were formerly capable of crossing short oceanic areas.

W. J. PHILLIPPS.
Dominion Museum,
Wellington, New Zealand.

The Nomenclature of the Banded Constituents of Coal.

IN view of the wide acceptance in Great Britain of the terms vitrain, clarain, durain, and fusain devised by Dr. Stopes to describe the banded constituents of British bituminous coal, and the introduction of the further terms anthraxylon and attritus by Dr. R. Thiessen, it may be of interest to define the relation between them. At a recent symposium of the Coal Research Club, at which both Dr. Stopes and Dr. Thiessen were present, it appeared to be agreed that the two systems have entirely different bases and that each has its validity and use. It was the important service of Dr. Stopes (*Proc. Roy. Soc.*, 1919) to replace the vague terms bright and dull coal by others capable of exact definition. The basis of her system is a lithological one. There are two kinds of bright coal. Vitrain is not in itself banded, and has a glassy lustre and conchoidal fracture. Clarain is inherently banded or striated, and consequently scatters light, and has a silky lustre, and does not break with a conchoidal fracture. These purely lithological characters are sufficient to define the terms, without resort to the microscope, a feature essential for practical purposes to retain. Dr. Stopes correlated them with the microscopic and chemical characters, but these are under further investigation.

Clarain, whether derived from a single plant fragment or from general debris, always shows marked structure in thin sections. In vitrain the structure, even if not entirely absent, is relatively obscured or obliterated, so that it produces no striation or scattering of light at the surface. Dr. Thiessen's terms, on the other hand, have a botanical, not a lithological basis. It is the contention, first advanced by White and Thiessen in 1913, that the bright laminæ of coal (which from their description must have been vitrain) are always derived from parts of stems and roots. This material Thiessen calls *anthraxylon*. The term suggests 'coal derived from wood.'

Dr. Thiessen perhaps underestimated the contribution of cortical tissues to coal. Miss M. Evans, at the University of Sheffield, has found much vitrain to consist of periderm, and I have under investigation a thick band of clarain consisting wholly of the periderm of a Sigillaria or Lepidodendron. Nevertheless, it is clear that Dr. Thiessen includes in anthraxylon all the associated tissues of stems and roots. His generalisation may be expressed in the statement 'all vitrain is anthraxylon.' The converse is not true: all anthraxylon is not vitrain; it may be clarain or even fusain, which Dr. Thiessen describes as 'carbonised anthraxylon.' Nothing could better illustrate the difference between the two systems of nomenclature.

In striking contrast to anthraxylon is the general plant debris, called by Dr. Thiessen attritus. The essential point is that whereas anthraxylon is of homogeneous botanical origin in stems and roots, attritus is of heterogeneous origin in plant debris of all kinds. It is a sort of concrete in which larger fragments (anthraxylon, spore-exines, cuticles, etc.) are embedded in a cement of finely comminuted debris. If the brighter components preponderate, it will be clarain; if the duller ones, it will be durain.

The relation between the two systems may be tabulated as follows:

A. ANTHRAXYLON (of homogeneous botanical origin from stems or roots).	A_1 Structure absent, obscured or faint.	Lustre glassy, fracture conchoidal or semi-conchoidal, not laminated.	VITRAIN.
	A_2 Structure well preserved.	A_2, I. Dull, friable.	FUSAIN.
		A_2, II. Lustre silky, minutely laminated.	CLARAIN.
B. ATTRITUS (of heterogeneous botanical origin, general plant debris).	B_1 Much anthraxylon present.	Lustre silky, minutely laminated.	CLARAIN.
	B_2 Little anthraxylon present.	Dull, compact.	DURAIN.

Should it prove that there is a vitrain not derived immediately from portions of stems or roots, this will simply mean that there is a kind of vitrain not contemplated by Dr. Thiessen. The two kinds of clarain could be distinguished as anthraxylous and attrital clarain respectively. Dr. Thiessen uses the adjective 'attritious,' but I do not think it happily formed, and consider 'attrital,' on the model of detrital, to be better.

CLARENCE A. SEYLER.
Nelson Terrace, Swansea.

The Action of Strychnine on the Cerebellar Cortex.

THAT strychnine has a stimulating action on the cerebellar cortex was shown by me a few years ago—(*Science*, 51, 413, 1920). On the application of strychnine to the surface of the *lobulus ansiformis* or cerebellar hemisphere the motor manifestations consist in increased tonus, together with clonus, affecting particularly the ipsilateral hindleg, though affecting also, to some extent, the forelegs and the contralateral hindleg. My positive results obtained with strychnine in the cat agree with those of Shimazono (*Arch. f. mik. Anat.*, 80, 397, 1912), who observed an ipsilateral increase of tonus after applying strychnine to the cerebellar cortex in the pigeon.

It becomes a matter of interest to determine the action of strychnine when applied to the surface of the *lobus anterior*, from which, as Sherrington showed, faradisation yields inhibition of decerebrate rigidity. I have observed that the application of strychnine to this surface results at times in remarkable phenomena: in one instance, the animal (cat) having been decerebrated under ether with the Sherrington decerebrator, 1 per cent. strychnine was applied to the surface of the *lobus anterior*. This quickly resulted in two motor pictures, which alternated regularly: (1) Head and neck dorsiflexed, movements of progression in shoulders, the forelegs being stiffly extended, movements of progression in hindlegs; (2) head, neck, and body flexed ventrally, the hindlegs in violent extension and the forelegs in extension of somewhat less degree. At other times the action of the strychnine on the *lobus anterior* is manifested simply by a heightened intensity of the decerebrate tonus.

A question which obviously demands an answer is whether the application of strychnine to the *lobus anterior* changes in any way the inhibition of decerebrate rigidity elicitable by faradisation of this surface. Bremer (*Arch. int. de Physiol.*, 25, 131, 1925) has already shown that the intravenous injection of strychnine does not modify the inhibitory response.

In my experiments the cat was decerebrated under ether with the decerebrator, and faradisation with bipolar electrodes was applied to the *lobus anterior*. There resulted the typical inhibition of the tonus in the forelegs; 1 per cent. strychnine nitrate was then